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On Automatic and Simultaneous Syntactic Changes*

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0. Introduction

Most linguists, in studying language change, have long assumed that there are changes which might well be described as being simultaneous, in that one change, D_x, occurs at the same time as another change, D_y. In addition, it has also been assumed that there are changes which might be termed automatic, in that one change, D_x, necessarily causes another change, D_y. In actuality, though, since the exact timing of changes is often hard to determine, it is generally the case that changes are counted as simultaneous if they at least appear to occur in close succession.

It should be clear that not all simultaneous changes are linked in the causal relationship implied by the label "automatic". In particular, two changes--for example a change in the articulation of some sound and a reanalysis of a syntactic construction--may have nothing to do with one another yet may just happen to occur (virtually) at the same stage in a language's development. More often, probably, two changes that are simultaneous--or nearly so, to be more accurate--do stand in a cause-effect relationship, so that one change can be taken to be a consequence of the other change. Even in such cases, though, there need not be any notion of necessity in the actuation of the second change, i.e. one does not have to be an automatic consequence of the other. Two examples from historical phonology demonstrate this difference well.

Martinet, in several works (e.g. Martinet 1953), has argued for the existence of so-called "drag-chains" in sound change, in which one sound shift leaves a gap in a system but "drags" another sound along with it to fill that gap. For example, under one possible interpretation of the Grimm's Law consonant shift in pre-Germanic, the shift of the Proto-Indo-European voiceless unaspirated stops, e.g. *t, to voiceless fricatives, e.g. *θ, left a gap in the consonant system that was then filled by the Indo-European voiced unaspirated stops shifting to voiceless unaspirated stops, e.g. *d ---> *t. In such an account, the *t ---> *θ change dragged along the *d ---> *t change. While Martinet has in general viewed such a second shift as a necessary consequence of the first, in actuality, sound systems tolerate many gaps happily, so the creation of such an imbalance in a system does not automatically occasion the filling of that gap through another sound shift. In such a case, then, two (virtually) simultaneous changes need not be causally linked.

An example of an automatic change, though, is provided by the restructuring of underlying lexical representations brought on by unconditioned sound changes. For instance, when Indo-European *d became Germanic *t, lexical forms which had had *d were restructured so as to reflect the new pronunciation, as in the change of the word for 'ten': /*dek'm/ ---> /*texum/ (cf. Gothic taihun, English ten, etc., and note that there were other changes as well not relevant here). At the point

at which *d became *t, there was no longer any support for underlying /d/ either from morphophonemic alternations or even distributional evidence, so the lexical form--under any set of theoretical assumptions about how such forms are established by speakers learning their language--would have to change when *d changed. Thus the restructuring would have been (virtually) simultaneous with the sound change and an automatic consequence of it.

This restructuring is an example of an automatic change from the realm of phonological change, but examples of automatic and simultaneous changes have been proposed for syntactic change as well. However, the cases that have been proposed for automatic and simultaneous syntactic changes are not without some problems. Accordingly, a brief review of some of these attempts at uncovering this type of syntactic change is undertaken here, and then two case-studies are presented from the history of Greek which provide stronger and more convincing instances of automatic syntactic changes.

It is important to point out, though, that it is very hard to prove conclusively that two changes are automatic or even that they are simultaneous; this is a recurring problem in the evaluation of such examples. However, where one can find either no evidence to the contrary or else positive indications that the two changes were not separated by long periods of time, it can be assumed that two changes which appear to be (virtually) simultaneous in fact are to be classified as such, for that assumption allows for the possibility of interesting claims regarding the nature of syntactic change.

Without the assumption of some kind of interaction between or among various changes, diachronic syntax becomes little more than a taxonomy of what changed between stage X and stage Y of a language; few, if any, interesting generalizations become possible about a theory of syntactic change, providing, for example, a delimitation of the range of possible changes in the syntax of a language. Therefore, wherever possible, the strongest position to take is that two apparently simultaneous changes are in fact simultaneous, for one can then work from there to try to find an explanation for this simultaneity. Accounting for one change in terms of another, by showing one to be an automatic consequence of the other, would be one way of providing such an explanation.[1]

Furthermore, such explanations for syntactic changes, when available, can be used as a way of constructing arguments for or against particular theoretical stances, under the assumption that a synchronic theory provides the constraints on possible changes a language may undergo.[2] Such a position has been taken, for example, by Lightfoot (1979a). He contends that Linguistic Theory should interact with a theory of change to pinpoint when grammars would undergo drastic reanalyses. One can further claim, following the line of argumentation being developed here, that a theory's ability to characterize one of two apparently simultaneous changes as being in fact an automatic change, a necessary consequence of and thus explained in terms of the other, should likewise count as an important criterion upon which to judge competing theories of grammar.

In particular, in the examination of the putative automatic changes from the history of Greek, an argument is developed against a derivational framework for a theory of syntax and in favor of a nonderivational approach. Briefly, a derivational theory of syntax is one in which rules apply in a certain order to produce a series of intermediate stages that convert a deep structure of a given sentence into a particular surface structure--the series of stages formed by the output of rule applications is called a derivation.[3] In a nonderivatinal framework, by contrast, there is basically no difference between deep structures and surface structures and thus one is not converted into the other via a series of intermediate steps; instead, some notion such as the designation of levels at which syntactic generalizations can be stated (e.g. initial syntactic level, final syntactic level, some combination, etc.)--as in current versions of Relational Grammar and Arc-Pair Grammar[4]--or some division of labor into components--e.g. semantic as opposed to syntactic, as in Generalized Phrase Structure Grammar with its rule-to-rule semantics--is employed. The analogue to a derivational theory's step-by-step rules in a nonderivational theory is a set of well-formedness conditions holding on surface forms, where elements can appear, in what combinations, how they relate to other elements in the sentence, and so forth. In such a system, the notion of derivation has no place.

Although comparing frameworks is a very tricky business, and perhaps not even possible, because the ground rules can be so very different in different frameworks, the two general approaches to syntax outlined here differ in one respect in the way they account for a particular change in Greek to be presented below. This distinction is discussed again in connection with that change after a look at some instances of automatic syntactic change that have been proposed in the literature.

1. Some Previous Attempts at Finding Automatic Syntactic Changes

Among the instances cited as examples of automatic syntactic change (though not necessarily labelled as such) are the following two provided by Lightfoot in various studies.

Lightfoot (1974, 1976, 1979a) has argued that a number of (nearly/virtually) simultaneous changes in the verbs which are now the Modern English modals (can, could, may, etc.) were the automatic consequences of a single innovative restructuring of the base rules in 16th century English. He claims that Old English and Middle English predecessors to the modals were real verbs, no different in any respect from other complement-taking verbs such as try or want, but that for a variety of reasons, they lost some verb-like features, e.g. no longer having full person and number paradigms, and were reanalyzed as forming a class distinct from that of try or want.

Thus, from a set of phrase structure rules as (1a) for Old and Middle English (which alternatively could have had the form in (1b)):

1. a. OE/ME: S ---> NP AUX VP
AUX ---> T(ense)

b. S ---> NP VP
VP ---> V + T (NP ...)

Lightfoot claims that 16th century English innovated a new expansion for AUX, creating a new deep structure category of modals (= M), and giving the rules in (2):

2. S ---> NP AUX VP
AUX ---> T (M)
M ---> can, may, ...

Furthermore, he claims that this new phrase structure rule, this single innovation, triggered the four changes listed below in (3) as automatic consequences:

3. a. no more infinitival forms of modals
b. no more gerund (-ing) forms of modals
c. only one modal per (simplex) sentence (in standard language)
d. no more have + MODAL + en combinations.

The absence of infinitival forms, for example, follows necessarily because the new modal class only occurred as a "sister" of T(ense) in the AUX node, a place where infinitives could not occur; similarly, the other changes in the modals are a necessary result of the nature of this new phrase structure rule.

In another work (1979b), Lightfoot proposes yet another instance of an automatic syntactic change, this time in the English passive, and this time the result of the addition to the grammar of a single transformational rule of NP Preposing. This rule led to the existence of a transformational rule of Passive whereas prior to the 16th century, Lightfoot claims, English had only a lexical passive rule. He is assuming a theory with a rigid distinction between lexical and transformational (or syntactic) rules, and argues that the properties of a syntactic rule as opposed to a lexical rule of Passive led to at least three automatic and simultaneous changes in English passives; in particular, three new passive sentence-patterns, listed below in (4), become possible:

4. a. passives with underlying indirect objects promoted (e.g. John was given a book)
b. "prepositional" passives (e.g. The terms were agreed upon)
c. passives with NP-subjects that do not bear a semantic relation to the main verb (e.g. John was expected to win).

These changes would have occurred automatically, Lightfoot claims, because the new transformational (syntactic) rule of Passive could move any NP after the verb to subject position, whereas, according to the properties of lexical rules the theory specifies, the lexical rule could only relate an active direct object with a passive subject. The sentence patterns illustrated in (4), then, could only arise with the advent of a transformational rule of Passive, so that these patterns are an automatic consequence, in Lightfoot's account, of the addition of such a rule to the grammar of English.

Despite these neat-looking examples of (virtually) simultaneous and automatic syntactic changes, Lightfoot's analyses are not uncontroversial and do not provide unqualified examples of this type of syntactic change. In particular, in each instance, one has to wonder whether Lightfoot has correctly identified cause and effect, i.e. is it really the case for the modals that the disappearance of the infinitival and gerund forms was the result of a base restructuring, or is it not possible that these forms were lost and only then was the grammar restructured to have a modal category to accomodate these now anomalous verbs? Furthermore, since other verbs do not have a full set of nonfinite forms--for some speakers, it seems that the verb stride does not have a past participle, with neither has strode, has stroden, has stridden, has strided, nor has stridded sounding acceptable[5]--the modals may just be a special case of the loss of nonfinite forms being generalized throughout a semantic class such as that formed by the modals.

Finally, exception can be taken to some aspects of Lightfoot's data. For example, regarding the modals, Lightfoot takes as significant the fact that the Oxford English Dictionary gives the last example of a modal infinitival or gerund form as occurring in the 16th century, even though the mere occurrence of a form in a text does not guarantee that it is still in current use (some texts are consciously archaizing, for example). Moreover, the process by which the verbs that ended up as the Modern English modals became specialized in their modal function and syntax was actually a very gradual change--for example, the gerund forms were rather rare at all prior stages of English[6]--and does not really display the suddenness that Lightfoot suggests. Thus, until the crucial examples that Lightfoot cites in support of his claims of simultaneity for these changes in question are subjected to careful philological scrutiny, his analysis has to remain tentative.

Moreover, Lieber (1979) has suggested that the factual basis for Lightfoot's claims about changes in English passive sentence patterns is faulty, for she finds in Old English passive sentences of the type Lightfoot says first appeared only in the 16th century. She concludes that Old English had a transformational (syntactic) rule of passive, as well as a lexical rule, and that the changes that in Lightfoot's account were simultaneous and automatic consequences of the addition of a rule of NP Preposing were features of Passive that were already present in the language. Such a finding, of course, if valid, renders this example of automatic syntactic change nothing more than a mirage.[7]

Besides these putative automatic, simultaneous changes due to restructuring or rule addition, there are also examples in the literature which invoke language universals, and claim that a change D_x automatically triggers another change D_y because D_x brings on a situation in which some universal is "activated", so to speak, and satisfying that universal requires the further change D_y. In such an instance, D_y is an automatic consequence of D_x and by the definitions adopted earlier, is simultaneous (or virtually so) with D_x. This type of explanation is evident in most of the work done recently on word-order change, in which putative universal correlations as in (5) have been called upon to explain, for example, a shift from postpositions to prepositions in Greek along with a shift in basic word order:[8]

5. OV with Postpositions / VO with Prepositions.

Another example involving universals is one described in Joseph (1978, 1980) concerning what happened to Greek Object Raising and Object Deletion sentences, i.e. constructions analogous to the English sentences in (6):[9]

6. a. Object Raising: John is easy to please.
   b. Object Deletion: Mary is pretty to look at.

when affected by the Greek replacement of infinitives by finite verbs.[10] In Greek, from Ancient Greek up to early Medieval Greek, there were Object Raising and Object Deletion sentences with a form entirely analogous to that found in English, with an infinitive in the complement clause and a zero-object (i.e. a missing object argument) with that infinitive on the surface.[11] Examples for pre-Modern Greek of Object Raising are given in (7) and of Object Deletion in (8), with a Ø marking the missing object argument:[12]

7. a. he: ergasia mathein Ø ... hraiste: edokei einai
      the-work/FEM.NOM learn/INF easiest/FEM.NOM seemed be/INF
      'The work seemed to be easiest to learn' (Xen. Oec. 6.9)
   b. tragoudousin to paranomon horo:sai Ø muste:rion
      sing/3PL the-illegal/NTR see/INF rite/NTR
      'They sing of the rite (which is) illegal to see' (Spanos 26 (12th century))

8. a. kai ... horan Ø stugnos e:n (Xen. Anab. 2.6.9)
      and see/INF gloomy/NOM was/3SG
      'And he was gloomy to look at'
   b. tous ... khrusinous hetoimous ekhei tou dounai Ø
      the-gold-pieces/ACC ready/ACC.PL has/3SG PRT give/INF
      'He has the gold pieces ready to give over' (Doukas 1164A, 13-14 (15th century)).

When the infinitive was replaced by a finite (i.e. person-marked and tensed) verb in late Medieval Greek, sentences corresponding to (7) and (8) continue in the language, but in a slightly different form; in particular, the late Medieval and Modern Greek continuation of the earlier Greek constructions now have a pronominal object in the complement clause that corresponds to the matrix subject. This is shown by the Modern Greek sentences in (9), where ta in (9a) and tin in (9b) are obligatory object pronouns in the complement clause:[13]

9. a. ta anglika$_i$ ine diskola na
      the-English/NTR.PL are difficult/NTR.PL PRT

      ta$_i$ katalavo
      them/NTR.PL understand/1SG

      'English is difficult for me to understand' (literally: "The English are difficult that I understand them")

b. i maria$_i$ ine omorfi na tin$_i$ kitazis
Mary/NOM is pretty/NOM.FEM PRT her/ACC look-at/2SG
'Mary is pretty to look at' (literally: "Mary is pretty that you look at her").

The change from a zero-object in the complement clause to an obligatory object pronoun can be taken as an automatic consequence of the change in the infinitive, i.e. in the nature of the complement clause verb itself, because of a putative universal constraint on Object Raising and Object Deletion constructions given in (10):[14]

10. Object Raising and Object Deletion cannot deprive a finite complement verb of its object.

This constraint is observed in several languages, including French, Spanish, German, Albanian, Irish, Korean, Mongolian, and Arabic (see Joseph (1978, 1980) for some discussion) and can account for the contrasts in (11) between unacceptable English Object Raising/Object Deletion sentences with finite complements versus acceptable ones with nonfinite complements:

11. a. *John would be difficult for me to imagine (that) I might invite Ø to my party
b. John would be difficult for me to imagine inviting Ø to my party
c. *Melina is too ugly for us to be able to convince John that he should kiss Ø
d. Melina is too ugly for us to be able to convince John to kiss Ø.

If this universal is valid, the change in the possibility of a zero-object as opposed to a pronominal object occurring in the complement clause of Object Raising and Object Deletion sentences would have been a necessary change, given the change in the type of complementation from nonfinite to finite.

A problem, though, with this account, and for that matter with any account making use of a universal, is that all universals are putative at best, subject to verification again and again as new data is brought to light, but therefore liable to be counter-exemplified by some piece of data not previously considered. For example, the potential Object Raising/Object Deletion universal given in (10) runs into some weak but nonetheless real counterexamples in English sentences such as (12):

12. a. ?A book like that is tough to claim that you've read Ø carefully.
b. ?This rock is too heavy to claim that I can pick up Ø.

While not fully acceptable sentences, nonetheless, those in (12) are not as bad as (1) predicts. Thus this universal has some validity, for the sentences in (12) are not wholly well-formed, but it cannot be an absolute universal. As a result, in a Medieval Greek Object Raising or Object Deletion sentence with a finite complement and a missing object with that finite verb, there would not have been any necessity for an object pronoun to arise, even if this might have been a likely or even

preferred development.

Similarly, many of the word order universals are of a statistical nature only, and meet with counterexamples (e.g. Papago and Persian appear to be exceptions to the correlations noted in (5)).[15] That being the case, one change would not necessarily force a second word-order change, at least as far as the correlation in (5) predicts.[16]

This cursory review of prior attempts to establish instances of automatic syntactic change shows that in order to get a good, i.e. relatively safe and unassailable, example of such a change, one needs cases in which either the data is clear or, if a universal is involved, it is one that is not controversial and can be supported by a wide range of relevant data. At this point, it is appropriate to examine two changes from the history of Greek which meet these requirements in order to demonstrate not only that automatic syntactic changes exist but also that they can be used in arguing for particular theoretical frameworks.

2. Copy-Raising in Greek

The two changes to be examined both involve and depend on a construction which can be referred to as "Copy-Raising". In order, then, to understand these changes properly, some background on this construction is needed. The Copy-Raising construction is one in which a nominal originating in--i.e. semantically linked (in initial structure) to--a complement clause appears superficially in a higher clause but shows an overt marker--in the form of a "copy" pronoun--of its presence in its "point of origin" (i.e. the lower clause). English sentences with the matrix predicate look like, as in (13a), have often been cited as examples of such a construction (the non-Raised version is given in (13b)):

13. a. Bill$_i$ looks like he$_i$ is ready to leave.
    b. It looks like Bill is ready to leave.

(13a), under such an analysis, would show a nominal (Bill) raised to subject status in the matrix clause with a copy (he$_i$) left in the complement clause.

This Copy-Raising construction is found in Classical and Hellenistic Greek, and has been studied in this context by Marlett 1976. Some examples are given in (14):

14. a. te:n ... huperbole:n to:n oreo:n ededoikesan
       the-pass/ACC the-mountains/GEN feared/3PL

       me: prokatale:phtheie (Xen. Anab. 3.5.18)
       lest be-occucpied/3SG

       'They were afraid that the mountain pass might be occupied' (literally: "They feared the mountain pass lest it be occupied")

b. epegino:skon de auton hoti houtos e:n
knew/3PL and him/ACC COMP this/NOM.MASC was/3SG

ho kathe:menos (Acts 3:10)
the-sitting/NOM.MASC.PPL

'And they recognized that he was the one sitting' (lit.: "They recognized him that he was the sitting one")

c. egno:n se hoti skle:ros anthro:pos ei
knew/1SG you/ACC COMP hard/NOM.SG man/NOM.SG are/2SG
'I knew that you were a hard man' (literally: "I knew you that you were a hard man") (Matt. 25:24)

Note that the copy is not always overtly present; because Greek has always been a language that suppresses unemphatic subject pronouns, a copy pronoun having subject status--as in (14a) and (14c)--does not have to appear on the surface. Marlett's analysis of these sentences as involving a Greek version of Copy-Raising, though admittedly not supported by hard evidence--such as demonstrably ungrammatical sentences and native speaker judgments--that is necessarily lacking for a "corpus language" such as Ancient or Hellenistic Greek, nonetheless can be adopted for two reasons. First, apparently synonymous non-Raising versions of such sentences can be shown to occur, and second, the logical structure of the predicates involved seems to point to a raising analysis (e.g. FEAR is a two-place predicate so that a sentence such as (14a) with a subject, a direct object, and a complement clause must not represent a basic structure with this verb).

Modern Greek also has a Copy Raising construction. Although it is not all that common a construction and is restricted to just a handful of verbs, nonetheless it is a construction-type in the language and so must be part of any descriptively adequate grammar that might be constructed for the language.[17] An example of this construction is given in (15):

15. θeoro tin maria pos mono afti ine eksipni
consider/1SG Mary/ACC COMP only she/NOM is/3SG smart/NOM.FEM
'I consider only Mary to be smart' (literally: "I consider Mary that only she is smart")

and it can be contrasted with a synonymous non-Raised version as in (16):

16. θeoro pos mono i maria ine eksipni
consider/1SG COMP only Mary/NOM is/3SG smart/FEM
'I consider only Mary to be smart' (literally: "I consider that only Mary is smart").

For Modern Greek Copy Raising sentences, the usual range of arguments based on selectional restrictions, idiom chunks, active/passive synonymy, Reflexivization, and Passivization are all available to show that the accusative noun phrase in such sentences corresponding to tin maria in (15) is in fact a main clause direct object on the surface and moreover corresponds to an initial-structure complement clause subject.[18] Most commonly in Modern Greek, as in earlier stages of the language, these Copy Raising sentences have no overt copy pronoun in the complement clause, for unemphatic subject pronouns generally do not appear on the

surface in Modern Greek; the occurrence of mono 'only' in (15) provides the emphasis necessary for the occurrence of the pronominal copy afti.

With these preliminaries concerning the nature of the Copy Raising construction out of the way, a description and account of the changes in this construction between (early) Post-Classical Greek and Modern Greek can be developed. The first change concerns a change in the form, specifically the person, of the complement clause copy pronoun in one subclass of Copy Raising sentences.

3. The Change in Complement Clause Agreement

In Copy Raising sentences in earlier stages of Greek, the raised nominal and the copy always were of the same grammatical person, as shown by the examples given earlier; for example, in (14b), both auton, the raised nominal, and houtos, the copy pronoun, are third person. Moreover, in sentences in which the raised nominal was coreferent with the matrix clause and therefore of the same person as the matrix subject, it appeared on the surface as the reflexive pronominal form; in such a sentence, then, the complement-clause copy likewise was of the same person as the matrix clause subject (and object). An example of such a Copy Raising cum Reflexivization sentence is given in (17), where the main clause subject--understood to be the second person plural form humeis (absent on the surface because it is unemphatic in this sentence)--the reflexive form heautous and the raising copy humin are all second person forms:

17. ouk epigino:skete heautous hoti ie:sous
not know/2PL yourselves/ACC COMP Jesus/NOM

khristos en humin (2Cor. 13:5)
Christ/NOM in you/DAT.PL

'Do you not understand that Jesus Christ is within you?'
(literally: "Do you not understand yourselves that Jesus Christ (is) within you?")

In Modern Greek Copy Raising sentences with Reflexiviation in the matrix clause, though, a difference from the earlier pattern exemplified in (17) is evident. In particular, the raised nominal (the reflexive form) and the complement clause copy still agree in person (as in (14) and in (17)), but they are both different in person from the matrix subject. Such a sentence is given in (18), where the matrix clause subject is first person (suppressed as unemphatic, but understood to be ego 'I/NOM'), while the reflexive form (ton eafton mu) is third person and the raising copy (aftos--in parentheses since it is overt only if emphatic) is also third person:

18. den θa afiso ton eafto mu na petixi (aftos)
not FUT let/1SG the-self/ACC my PRT succeed/3SG he/NOM
'I won't let myself succeed' (literally: "I won't let the self of me that he succeed").

Even though, as noted above, the raising copy can be absent on the surface if, as is most usually the case, it is unemphatic, the third

person verb agreement in the complement clause gives an indication of what person its subject is understood to be, and shows that it is different from that found in the matrix clause (as shown by the matrix clause first person agreement). There is thus a syntactic difference in Copy Raising sentences between Hellenistic Greek and Modern Greek in the person of the raising copy (and thus in the verb agreement in the complement clause when the copy is the subject) when the raised nominal is subject to Reflexivization in the main clause. It is this syntactic difference which demands an explanation.

One fact which is relevant for an explanation of this change is that the reflexive form itself has a different character in Modern Greek from that found in earlier stages of the language. In particular, in Ancient Greek and Hellenistic Greek, the reflexive was a pronominal form, agreeing in person with its antecedent and showing different forms for the different persons; a portion (accusative case only) of the paradigm for the Ancient Greek reflexive pronoun is given in (19):

19.	1SG	emauton (MASC)	emaute:n (FEM)	
	2SG	seauton	seaute:n	
	3SG	heauton	heaute:n	heauto (NTR)
	1PL	he:mas autous	he:mas autas	
	2PL	humas autous	humas autas	
	3PL	heautous	heautas	heauta (NTR)

and the Hellenistic paradigm was similar.[19] In Modern Greek, though, the reflexive is itself a fixed form, consisting of ton eafto, literally "the self", with a possessive pronoun; it thus has the form of a possessed nominal,[20] being literally "the self" with a possessive pronoun and thus structurally parallel to ton adelfo 'brother' with a possessive pronoun. The reflexive form, therefore, is syntactically a third person nominal, just as is any nonpronominal noun phrase. The possessive pronoun is the only thing in the reflexive form that necessarily[21] shows agreement with the reflexive antecedent. A partial (accusative only) paradigm of the reflexive form is given in (20), along with the possessed form of 'brother' for comparison:

20.	1SG	ton eafto mu	1PL	ton eafto mas
	2SG	ton eafto su	2PL	ton eafto sas
	3SG	ton eafto tu (M/N)	3PL	ton eafto tus (M/N/F)
		ton eafto tis (F)		

cf. ton adelfo mu/su/tu/tis/mas/sas/tus
'my/your/his, its/her/our/your/their brother'.

This change in the form of the reflexive took place at least as early as the 12th century; an example from the poems of Glykas is given in (21):

21. na pnikso: ton heauton mou (Glykas 288 (12th cent.))
FUT drown/1SG the-self/ACC my
'I will drown myself'.

There has thus actually been a multiple change in the form of Raising cum Reflexive sentences between earlier stages of Greek and Modern Greek. The reflexive form and the copy found in Raising cum

Reflexive sentences have both changed so as to differ from the matrix subject (the reflexive antecedent) in person. It seems, therefore, that two (virtually) simultaneous changes have occurred, and moreover, it can be shown that this set of changes provides an excellent candidate for consideration as an automatic syntactic change. In particular, it seems that the change in the form of the complement clause copy pronoun in such raising sentences is an automatic consequence of the change in the form of the reflexive.

The motivation behind the necessary change of the copy to third person along with the change of the reflexive to third person status is the following universal:

22. A copy must agree in all relevant features (i.e. relevant to the language in question, e.g. person and number) with the nominal of which it is a copy.

It is safe to say that most linguists would agree that (22) is a fairly uncontroversial universal, one for which it would be very hard to find counterexamples. For instance, one class of apparent counterexamples, namely sentences such as (23):

23. John, I can't stand the idiot

is probably best analyzed as involving dangling topics rather than a nonagreeing copy. Furthermore, the need for such a universal independent of the Greek Raising cum Reflexive sentences under consideration is shown by copy/antecedent agreement in a variety of constructions in a variety of languages, including English look-copy sentences (cf. (13) above) and Left-Dislocation sentences, as in (24):

24. a. The scissors$_i$ look like they$_i$/*it need to be sharpened.
    b. John, I can't stand him/*her/*it.

If this universal is valid, then a ready explanatin is provided for the apparent automatic nature of the syntactic change in question here. When the reflexive changed in person, the universal would guarantee that the copy pronoun in the complement clause—inasmuch as it is a copy of the nominal that surfaces as the reflexive—would also change.

The only potential problem with this account—and thus with taking this change as a true instance of an automatic syntactic change triggered by a universal—is the fact that it cannot be conclusively demonstrated that the change in the complement clause copy was simultaneous with the change in the reflexive. Unfortunately, as is so often the case in such investigations, there is not very much historical data to back up the claim. However, in this instance, there is at least some. The reflexive change, as noted above (cf. (21)), took place no later than the 12th century. The first Raising cum Reflexive sentence, though, that occurs in Greek after the reflexive change dates from the late 16th century, from the Cretan comedy Katzourmbos:

25. thelo: aphe:sei ton emauto mou ... na ...
want/1SG let/INF the-self/ACC my PRT

ksale:smone:se: (ton nou mou) (Katz. II.173-4)
forget/3SG the-mind/ACC my

'I won't let myself forget my mind'.

In interpreting this sentence as a relevant example for the discussion here, it is necessary to take the third person singular verb agreement exhibited by the complement verb ksale:smone:se: as indicating that the complement clause subject--absent on the surface because of unemphatic subject pronoun drop in Greek--was third person. What makes this sentence valuable, despite the four centuries between it and the reflexive change is the fact that no counterexamples, at least, with agreement patterns different from those in (25), are to be found. Sentences such as these, by their very nature, might well be expected to be quite rare,[22] so that despite the scarcity of conclusive historical data, there is really nothing standing in the way of taking (25) and its kind to represent a change that occurred concomitantly with the changes in the reflexive evidenced in (21). This consideration and the strong--and generally unassailable--universal in (22) that has been proposed to be at work in the change combine to make this a very good candidate for a real example of an automatic syntactic change.

4. Sneaky Passives Diachronically

Another aspect of the Copy Raising construction provides another instance of a syntactic change which, though lacking in some of the crucial historical data, nonetheless seems to be a real instance of an automatic syntactic change. In this case, however, there are some interesting theoretical dividends concerning differences between derivational versus nonderivational frameworks that can be reaped from the account of the change.

This change concerns the status of Copy Raising sentences in which the complement clause is passive and the raised nominal corresponds to the agentive noun phrase in the complement clause. An example of such a sentence from Ancient Greek is given in (26):

26. dedoik' emauton ... me: poll' agan
fear/1SG myself/ACC not much/NOM.PL.NTR too

eire:mena e: moi (Oed. Tyr. 767)
said/PASS.PPL.NOM.PL.NTR be/3SG me/DAT

'I fear that too much has been said by me'.

Such sentences can be referred to as "Sneaky Passives", following Perlmutter & Soames (1979: 164ff.). because in a derivational framework, these can be derived by applying Copy Raising in the matrix clause and then applying Passive "sneakily" into the complement clause; this latter step is possible because Copy Raising leaves a fully-intact complement clause, complete with subject (the copy pronoun) and object, and thus meeting the structural requirements for application of a passive rule.

This derivation is sketched in (27):

27. UNDERLYING STRUCTURE: $_S$[I fear $_S$[I say too much]$_S$]$_S$

COPY RAISING : [I fear myself [I say too much]]
(+ REFLEXIVE)

PASSIVE ("SNEAKILY"): [I fear myself [too much be said by me]]

where many details of structure have deliberately been left out.

Sneaky Passives were fully grammatical in earlier stages of Greek, as (26) indicates. It is important to note that Copy Raising could in general operate on oblique nominals, as shown by examples (17) above and (28) below:

28. a. phoboumai humas me: eike: kekopiaka eis humas
fear/1SG you/ACC.PL not in-vain worked/1SG among you/ACC.PL
'I fear that in vain have I spent my labor among you'
(literally: "I fear you lest I have spent my labor among you in vain") (Gal. 4:11)

b. kai poiei pantas$_i$ ... hina do:sin autois$_i$ kharagma
and cause/3SG all/ACC.PL COMP give/3PL them/DAT mark/ACC
'And he caused everyone ... to receive a mark'
(literally: "He caused everyone$_i$ that they$_j$ give to them$_i$ a mark") (Rev. 13:16)

The fact that oblique nominals were eligible for Copy Raising means that a "Sneaky Passive" sentence such as (26) actually has two possible derivations. Besides the one outlined in (27), there is also a derivation in which passive applies in the complement clause followed by Copy Raising of the agent nominal created by passive into the higher clause. It is significant that (28b) shows Copy Raising of a dative noun phrase (autois), since it shows that even if the eligibility conditions for Copy Raising were stated in terms of case-marking, such a derivation for (26)--where the nominal corresponding to the raised noun phrase in the complement clause is a dative, moi--cannot be ruled out. It can be concluded, then, that a sentence such as (26) indeed has two possible derivations--the "Sneaky" Passive derivation and the one in which first Passive applies in the lower clause and then Copy Raising in the higher clause.

Sometime between Ancient Greek and Modern Greek, and unfortunately there is absolutely no textual evidence to indicate when this may have occurred, a change took place in Copy Raising. Whereas in Ancient Greek, it seems that any nominal could be raised to object status in a higher clause (cf. the raising of obliques in (28)), in Modern Greek Copy Raising is restricted to operating only on subjects.[23] Thus, sentences such as (29) are ungrammatical:

29. *θeoro ton yani pos ton vrika ili0io
consider/1SG John/ACC COMP him/ACC found/1SG stupid/ACC
'I consider John that I found him (to be) stupid'.

Since there is no indication regarding the status of such sentences in Medieval Greek, the assumption can be made that the Modern Greek evidence shows that the change in which nominals can be raised via Copy Raising has taken place within the Modern Greek period, i.e. in what is roughly the contemporary language.

What is interesting here is that besides this change in the eligibility of nominals for Copy Raising, there is another change, namely a change in the status of Sneaky Passive sentences. In Modern Greek, Sneaky Passive sentences are ungrammatical, as shown by (30):

30. *θeoro ton yani pos i maria vlaftike apo afton
consider/1SG John/ACC COMP Mary/NOM hurt/3SG.PASS by him/ACC
'*I consider John that Mary was hurt by him'.

Thus it appears that this is another instance of a simultaneous change--a change in what can raise occurs together with a change in the status of Sneaky Passives. Although the mere apparent (or stipulated) simultaneity of the two changes does not mean that one is an automatic consequence of the other, as noted above in section 1, it is desirable to treat them as having that relationship, for then one change can be explained in terms of the other. Thus, following that line of reasoning, an account is developed below in which the change in Sneaky Passives is an automatic consequence of the change in the Copy Raising construction; any such account necessarily is stronger--and thus more interesting and preferable--to one in which the changes are unrelated (again, as noted in section 1).

In a nonderivational framework, as pointed out in section 1, there are no syntactic rules that work to convert a deep structure into a surface structure via a series of phrase-markers (or the equivalent). Instead, sentences are generated in their surface forms in accordance with the analogue of syntactic (transformational) rules, namely well-formedness conditions on these surface strings. The analogue of Subject-to-Object Raising, for instance, would be a well-formedness condition sanctioning the occurrence of a nominal that is semantically "relevant" (to use as theory-neutral a term as possible) only in a lower clause (i.e. it bears a logical relation only in that clause) as an object in a higher clause. Put in terms of a nonderivational framework with a recognition of syntactic levels and grammatical relations, such as Arc Pair Grammar or Relational Grammar, such a condition would allow an initial level complement clause nominal, e.g. a subject, to occur as a final level matrix clause object.

In such a framework, Ancient Greek Copy Raising would be a well-formedness condition such that a nominal bearing any final level grammatical relation in the complement clause may "legally" be the matrix clause object. This condition is stated in slightly more formal terms in (31):

31. Condition on Ancient Greek Copy Raising:

The final complement GR_X (= any grammatical relation) is the final matrix clause GR_2 (= direct object).

In other words, (31) allows the occurrence of Copy Raising sentences in which the final matrix object bears any final level grammatical relation in the complement clause.

A condition such as this sanctions Sneaky Passives such as (26), repeated here for convenience:

26. dedoik' emauton ... me: poll' agan
fear/1SG myself/ACC not much/NOM.PL.NTR too

eire:mena e: moi (Oed. Tyr. 767)
said/PASS.PPL.NOM.PL.NTR be/3SG me/DAT

'I fear that too much has been said by me'.

because the matrix object emauton--which does not bear a logical relation to the matrix verb--bears some final grammatical relation in the complement clause, namely the relation of the agent in a passive clause (the "Chômeur" relation of Relational Grammar, the 8-relation of Postal's Arc Pair Grammar). The well-formedness condition states only that this nominal must bear some relation in the lower clause; it does not restrict which relation this might be, so that passive agent meets the requirements of the condition.

In Modern Greek, though, the well-formedness condition for Copy Raising sentences has changed so that instead of being able to be any complement clause grammatical relation, the matrix object can only be the final complement clause subject (as noted earlier--recall example (29)). The Modern Greek version of this condition is given in (32):

32. Condition on Modern Greek Copy Raising:

The final complement GR_1 (= subject) is the final matrix clause GR_2 (= direct object).

This differs from (31) just in the specification of GR_1 as opposed to GR_x, that is, a relatively minor change from a formal standpoint. However, it is a change that has important consequences. In particular, (32) automatically rules out Sneaky Passives because in Sneaky Passives, the matrix object in a Copy Raising is not the final complement clause subject, but rather is the final passive agent (i.e. chômeur or 8-relation).

There are admittedly a few potential problems with this account. In particular, since in Greek Raising there is a copy of the raised nominal in the lower clause, is it the copy or the matrix object that is considered to bear the relevant grammatical relation in the lower clause? It may be necessary to stipulate something to the effect that a copy counts the same as the form of which it is a copy in terms of satisfying the well-formedness conditions and the "is" relationship utilized in the Raising well-formedness conditions (i.e. in (31) and (32)). Alternatively, the existence of a chain of "control" linking the matrix object with its copy in the lower clause may be sufficient. This particular problem, however, is not a problem just for Copy Raising but

rather is a general problem of determining how the overall syntactic framework should treat copies of nominals that bear particular grammatical relations.

Still, in this framework, the problem posed by the apparent simultaneity of these two changes--the change in what can raise and the change in the status of Sneaky Passives--finds a straightforward solution, for the change from (31) to (32) automatically triggers the change in the acceptability of Sneaky Passives. The ease with which the nonderivational framework can account for these two changes is striking, for it contrasts with the extra machinery and extra assumptions needed in a derivational account of the changes.

For convenience in exposition, a derivational framework is assumed here in which rules are stated in terms of grammatical relations; this decision allows for easier comparison with the nondeirvational account outlined above, for rules in that account are so stated. The main assumption behind a derivational approach is that syntactic rules convert an initial structure into a surface structure through a series of sequentially-ordered steps (phrase markers, in the terminology of transformational grammmar). Raising, therefore, in such a framework is a "process" by which a nominal in a lower clause becomes the object in a higher clause. For the sentence-type under consideration, i.e. sentences parallel in structure to (26), it has been established (see above, earlier in this section) that two derivations--two sets of sequentially applied syntactic rules--are possible: first Passive in the lower clause followed by Raising in the higher clause but also the "Sneaky" Passive derivation with first Raising in the higher clause and then Passive applying "sneakily" in the lower clause left intact by Copy Raising.

It is well-known that the assumption of sequentially-ordered rules in syntax has led to the recognition of the need for the cyclic application of syntactic rules. That is to say, natural languages exhibit syntactic phenomena, well-discussed in the literature,[24] which require recourse to a device such as cyclic rule application in order to be accounted for in a derivational framework. In cyclic rule application, syntactic rules apply as a block sentence by sentence from the most deeply embedded clause in the phrase marker to the topmost (matrix) clause. In a derivational framework, therefore, the cycle has been posited as a linguistic universal.

Similarly, along with the cycle, it turns out that there are phenomena in natural languages which require the imposition of a constraint--the Strict Cyclicity constraint--which prevents a rule from applying (or reapplying, as the case may be) into an already cycled-on domain. With such a constraint, once a higher clause has been reached in the cyclic application of rules, a lower clause--an already cycled-on domain--would not be a possible domain for a rule. With Strict Cyclicity, rules cannot "reach down", so to speak, so as to apply entirely within a cyclic domain that has already been passed. As with the cycle itself, the Strict Cyclicity condition has been proposed as a linguistic universal.

However, in at least some versions of derivational frameworks, there are rules which can be called noncyclic or postcyclic, i.e. they

are not "in" the cycle. These rules, moreover, can apply freely into already cycled-on embedded clauses. An example of such a rule would be Relativization or Question Movement;[25] thus a question word which originates in an embedded clause nonetheless can be fronted when the matrix clause is reached after the cycle, as in (23), where the Ø indicates the deep structure point of origination of the question word:

33. Who did Sally think John felt Bill was ready to hit Ø?

One interpretation of this observation is that the principle of Strict Cyclicity is valid only for cyclic rules, and does not hold, universally it would be posited, for rules not in the cycle (whether demonstrably post-cyclic or simply not demonstrably cyclic) rules. This is an interpretation which becomes crucial later on in the discussion.

Thus, a derivational framework has derivations, it has the cycle, and it has a principle of Strict Cyclicity that is restricted to cyclic rules. Given these elements of the framework, the change in Greek Copy Raising would automatically trigger a change in the status of Sneaky Passives. For Ancient Greek, the framework just outlined would allow only the derivation of Raising cum Passive sentences such as (26) only via the derivation in which Passive applied in the lower clause and then Raising applied in the higher clause to raise the now passive agent to object status (recall that in Ancient Greek, Raising could operate on nonsubject nominals). The other possible derivation--the "Sneaky" Passive derivation by which first Raising applied in the higher clause and then Passive "snuck" down into the lower clause to apply and put the original subject into an agentive phrase--would be ruled out becuse it would violate the principle of Strict Cyclicity (by reaching down into an already cycled-on domain).

Therefore, the change in which nominals were eligible for Raising (see (31) and (32) above) would be reflected also in a change in the status of Sneaky Passive sentences such as (30), because the only way (30) could be derived in this framework is by Raising an oblique (agentive) nominal (the other derivation being ruled out by Strict Cyclicity). A restriction on what can raise--from any nominal to only subjects--therefore automatically leads to a situation in which the only possible derivation for a sentence is systematically ruled out. Such a sentence is thus ungrammatical, for it cannot be derived.

At this point, from a comparison of the derivational account just presented and the nonderivational account preceding it, it would appear that the two accounts are equivalent. In both accounts, the change in Sneaky Passives falls out as an automatic consequence of the change in Copy Raising acting in concert with certain aspects of each framework that are either built-in or are universal parts of the theory in question (as the cycle is in a derivational framework).

However, on closer inspection, it turns out that there is a crucial difference between the two accounts. In particular, the derivational account must make one further, unwarranted and thus unmotivated assumption.

It came out earlier in the discussion that under certain interpretations of the way in which rules such as Question Movement operate, the principle of Strict Cyclicity would have to be valid only for cyclic rules. The consequence of such a restriction of this principle, however, is that only as long as Passive is a cyclic rule will it be constrained by Strict Cyclicity so as not to apply "sneakily" into an already cycled-on domain. That means that the derivational account must make the additional assumption that the rule of Passive stayed as a cyclic rule between Ancient Greek and Modern Greek, i.e. that it maintained its "cycle-type" and did not become noncyclic. This is a result which could be guaranteed by an appropriate typology of cyclic rules, such that a rule with properties such as the Passive rule has would necessarily be a cyclic rule, but in the absence of such a typology,[26] it would constitute an extra assumption necessary in a derivational framework. This result would mean further that the ungrammaticality of Sneaky Passive sentences in Modern Greek really is not an automatic consequence of the change in Copy Raising, for Sneaky Passives could have remained grammatical if Passive had changed its cycle type and become a noncyclic rule (and thus not subject to Strict Cyclicity).

Furthermore, there is some evidence to suggest that rules can change their cycle type diachronically and move from being a cyclic rule to being noncyclic. In particular, Reflexivization (at least the so-called "Direct Reflexivization") in Ancient Greek, as best as can be determined, was probably a cyclic rule, inasmuch as it interacts with apparent EQUI and Raising constructions much as Reflexivization in English interacts with the English analogues of those constructions. Since that interaction in English has generally been taken as evidence for the cyclicity of Reflexivization in English, a similar conclusion can be drawn for Ancient Greek Reflexivization.[27] However, in Modern Greek, due in part to the change in the morphological make-up of the reflexive expression (see the discussion in section 3 regarding (19) and (20)), Reflexivization must be taken as a noncyclic rule. The crucial sentences that lead to this conclusion are the following:

34. a. den θa afiso ton eafto mu na me katastrepsi
NEG FUT let/1SG the-self/ACC my PRT me/ACC destroy/3SG
'I won't let myself destroy myself' (literally: "I won't let myself that he destroy me")

b. *den θa afiso ton eafto mu na katastrepsi ton eafto tu
his

c. *den θa afiso ton eafto mu na katastrepsi ton eafto mu
my.

If Reflexivization were cyclic, then it would be expected that (34c), with multiple occurrences of ton eafto mu, in both the lower clause and the higher clause, would be grammatical. However, (34c) is ungrammatical, as is (34b), where there is a reflexive form in the lower clause but the possessive that occurs with it is third person (agreeing with the person of the reflexive in the higher clause). The only acceptable version of such a sentence with Raising and Reflexivization[28] is that given in (34a), in which there is Raising and Reflexivization in the higher clause but no evidence of Reflexivization in the lower clause. Such facts run counter to the predictions made by an assumption

of cyclicity for Reflexivization in Modern Greek, so it can be concluded that the rule is noncyclic in this stage of the language and that therefore Reflexivization has changed its cycle-type between Ancient Greek and Modern Greek.[29]

An additional example of a change in cycle-type of a rule has been proposed by Haiman 1974. He argues that various phenomena connected with the Verb-Second constraint in Germanic languages first entered particular grammars as postcyclic processes, subsequently became cyclic, and in some cases forced a deep structure reanalysis. For instance, he points to the fact that many dummy pronoun insertions (e.g. the it of English it-Extraposition, there of there-insertion, etc.) are cyclic in modern Germanic languages but appear to be postcyclic in earlier stages of the langauges in question. A similar analysis is offered for the Verb-Second Constraint itself.

These two examples, Greek Reflexivization and the Germanic Verb-Second constraint, suggest that a change in cycle-type is a possible type of change that a rule (or grammatical constraint) can undergo in a derivational theory. That being the case, the change in Sneaky Passives can only be an automatic consequence of the change in what can undergo Raising if it is assumed that Passive stayed a cyclic rule in Greek (or if an adequate typology of cyclic rules is developed--see footnote 26); since there is no reason, in the absence of a suitable typology, why Passive should remain cyclic, it must be concluded that the derivational account cannot adequately characterize a relationship between the change in Sneaky Passives and the change in Copy Raising.

Thus the nonderivational account actually provides a better explanation of these changes in Greek than the derivational account does, for it does not require the additional ad hoc assumption regarding the maintenance of cycle-type for Passive. Consequently, the nonderivational account is to be preferred. These differences are summarized in (35):

35. In order for the change in Sneaky Passive to be automatically accounted for:

    a. a derivational account needs:

        i. the cycle and a principle of Strict Cyclicity valid for cyclic rules (this is given by the theory)
        ii. the change in the Raising rule (see (31) and (32))
        iii. the assumption that Passive maintains its cycle-type and is therefore subject to Strict Cyclicity

    b. a nonderivational account needs:

        i. a notion of levels to which syntactic rules can make reference (this is given by the theory--in the version of nonderivational grammar assumed here)
        ii. the change in the Raising rule (see (31) and (32)).

The nonderivational account has no derivations and therefore no cycle; the problem of change in cycle-type is, for such a framework, really only a pseudo-problem, for it is one that is forced only by the

ground rules of the derivational framework. Thus this syntactic change in Greek makes it clear how a derivational framework is burdened by all sorts of extra devices and machinery, such as the cycle, as well as problems, such as a change in cycle-type, that are, in a real sense, nothing more than artifacts of these extra devices.

5. Conclusion

By way of conclusion, a summary of the results developed here can be given, as well as a recognition of some remaining problems.

First, it should be clear that automatic syntactic changes do exist, even though some of the previous attempts at uncovering such changes are probably not as conclusive as they might appear at first to be. The examples involving changes in the Greek Raising construction seems to be fairly good cases of automatic syntactic change.

Second, it is also clear that different theoretical frameworks handle the same syntactic change in different ways, demonstrating that the view that emerges of what changes there are in a language is to a large extent colored by one's view of how synchronic grammars are to be characterized. It is possible, moreover, to compare the accounts that are provided in different frameworks. Lightfoot (1979a) has claimed that diachronic syntax provides "a new style of argumentation for choosing between competing theories and synchronic descriptions, by requiring that the theory interact with a theory of change to account for the point at which grammars undergo reanalyses or 'catastrophic' changes". The suggestion here is that the ability to relate simultaneous changes as being automatic changes is another criterion for deciding between competing theories to which diachronic syntax can contribute.

Third, given such a criterion for deciding between competing theories, the evidence from the change in the status of Sneaky Passive sentences in Greek shows that a nonderivational approach to syntax is to be preferred over a derivational approach, for the latter provides a simpler and less ad hoc account of the Sneaky Passive change and of the means for connecting the Sneaky Passive change with the Copy Raising change in a manner that is both natural and automatic.

Finally, it is only fair to mention what seems to be the only real problem with the discussion of these changes in Greek syntax, namely the lack of conclusive historical evidence. There are clear indications about the status of the relevant constructions in the first stage, Ancient Greek (i.e., in this context, Classical and New Testament Greek), and about the last stage, Modern Greek, but only meager indications about the intervening stages, especially in the case of the Sneaky Passive construction. Unfortunately, there is nothing that can be done about the lack of data;[30] it is simply a fact of life in historical studies that crucial data can be missing. One might simply dismiss these otherwise very interesting examples for that reason or else take them at face value and try to grapple with them. The latter approach has been adopted here, for the former seems counter-productive in that it limits the extent to which an understanding of syntactic change can be increased.

Notes

*This paper was read as an invited lecture to the Indiana University Linguistics Club in March of 1980. What is published here is essentially that version, with a few relatively minor changes in organization and diction, as well as updating of references, providing of footnotes, etc.

1. There are of course other modes of explanation that one might explore, such as a functional or social motivation for the occurrence of one change or another. It is my belief that no one type of explanation, whether formal (such as is pursued here), functional, social, or whatever, precludes the investigation of causation from one of the other perspectives, i.e. there is not only a formal side to language (how it is represented in a speaker's individual competence), but also a functional side (the uses to which a speaker puts this competence), a social side, etc.

2. This assumption is justified by the view in which diachrony is seen as the transition of a language through a succession of synchronic stages. Linguistic theory provides the constraints on possible synchronic systems, so that the movement through time is always the movement of one possible system into another possible system. Therefore, a theory of synchrony must be able to account for (at least certain aspects of) diachrony as well. While it may be true that not all linguists would adhere to such a view, it is not an idiosyncratic one; Culicover (1984: 118), for example, labels such an assumption "reasonable".

3. Although the issue of whether grammars are derivational or not is less an issue now than when this paper was first written (1980), it is important to note that some still-current theories are derivational in principle, including Government and Binding Theory (despite the considerable limitation on the number of rules that apply to convert deep structures into surface structures), while others, including Generalized Phrase Structure Grammar, are distinctly nonderivational.

4. See, for example, Postal 1986, and the papers in Perlmutter 1983 and in Perlmutter and Rosen 1984.

5. To my ear, has stridden does not sound all that bad. As Jeffrey Huntsman of Indiana University has kindly pointed out to me, the form stridden does occur in a variety of texts and there is also the form bistridan in Old and Middle English; moreover, the oddity of a perfect tense formation with stride may be more a function of the relative infrequency of the base verb itself, and not a peculiarity associated with the past participle.

6. I am grateful once more to Jeffrey Huntsman of Indiana University for reminding me of this important fact.

7. The debate perhaps should not be closed on this point, however, for Russom (1982) has shown that Lieber's examples of syntactic passives in Old English have been misanalyzed. I leave this matter to future research, inasmuch as my intent here was only to provide an example that

has been given in the extant literature of a change that would be simultaneous and automatic in the sense developed here.

8. The literature on word-order change and the relevance of universals is enormous, and no attempt can be made here to even briefly survey the field; the reader is referred to Hawkins (1979, 1980, 1982a, 1982b, 1983), Smith 1981, Coopmans 1984, and Payne 1985 for discussion.

9. The exact analysis of these sentences is irrelevant to the point being developed here. In particular, in some theoretical frameworks, e.g. Government & Binding Theory, there is no "raising" at all in (6a) but rather WH-Movement, and in nonderivational frameworks, there are no raising or deletion processes at all. Moreover, in some accounts, both sentence-patterns in (6)--despite some differences they exhibit, for example, in the possibility of extraposition--are treated as involving the same type of syntactic structure. Such considerations are irrelevant to the matter at hand because in any theoretical framework, sentences such as those in (6) and the construction-type(s) they represent must be accounted for in some way, and the point regarding automatic changes in the Greek equivalents of these patterns can thus be translated into the appropriate theoretical analogue.

10. For details on the loss of the infinitive in Greek, see now Joseph 1983 and references therein.

11. There is of course also a missing subject argument as well with the infinitive, a fact which is less significant for the changes to be described here than the missing object.

12. For further examples and discussion, see Joseph (1978, 1980, 1983).

13. It is important to point out that the complement object was obligatorily missing in these constructions from Ancient Greek up through early Medieval Greek. Examples of these constructions from Medieval Greek are to be found in Joseph (1978, 1980, 1983).

14. I purposely state the constraint in this form, mentioning specific constructions, and not in some more general manner (e.g. utilizing the various versions of the Tensed-S Condition of Chomsky 1973) in part because it is irrelevant just how generally this constraint holds in the grammar, as long as it is valid for the constructions under consideration, and in part because I feel that there is sufficient reason not to believe that the Tensed-S condition is a valid condition (cf., for example, the possibility of WH-Movement out of tensed clauses--though such constructions admittedly have a different analysis in Chomsky's framework).

15. Hawkins (op. cit.), though, does attempt to address this problem through the use of implications involving more than two elements, which he claims leads to better statistical validity (e.g. SOV ---> (ADJ + N ---> GEN + N)).

16. This point has been made most recently by Payne 1985, though see also Coopmans 1984.

17. The exact analysis of this construction has been the subject of considerable debate among generative grammarians of Modern Greek; see, for example, Joseph (1976, 1978: Chapter 10, 1980), Philippaki-Warburton (1979, 1986), Kakouriotis 1979, Ingria 1981, inter alia. The facts under consideration remain the same, and the debate has been spurred in part by changes that have been made in the assumptions that underlie the theoretical frameworks adopted by different linguists.

18. See the references in footnote 17, especially Joseph (1976), for details. Note that even in those frameworks (e.g. that of Ingria 1981 or Philippaki-Warburton 1986) in which no raising is assumed for this construction, there is obligatorily a "linkage" between the matrix accusative nominal and the complement clause subject position. Thus, the account to be given here of changes in this construction, an account which, given the framework adopted here, depends on the assumption of Copy-Raising, could be translated into a framework with no raising through the use of this obligatory linkage.

19. Admittedly, the second person plural form in (17), heautous, differs from the Ancient Greek form, and shows generalization of the older third person plural form; however, heautous in (17) can be assumed to be person marked since person was still paradigmatic in the Hellenistic reflexive, with overt person distinctions found in the singular, for example.

20. For example, the reflexive can be modified by an adjective in the manner that nouns are modified, with the adjective between the definite article and the nominal, but not in the manner that pronouns are modified, with the definite article and adjective after the nominal; for complete details and further relevant arguments, see Joseph & Philippaki-Warburton (1986: sections 1.6 and 2.1.2.2).

21. Optionally, the reflexive form itself can occur as a plural if the antecedent is a plural noun phrase, as in :

i. emis kitazume tus eaftus mas
we/NOM watch/1PL the-selves/ACC.PL our
'We are looking at ourselves'.

In such a case, the reflexive form shows agreement in number with the antecedent, but this agreement does not encode person on the reflexive form nor is it obligatory.

22. For example, in Modern Greek written documents (books, magazines, newspapers, etc.)--a much larger "corpus" than is available for Medieval Greek, especially Medieival Greek of the 10th to 14th centuries, i.e. near when the Reflexive change occurred--I have found only two examples of Raising cum Reflexive sentences. Native speaker judgments of the form that such sentences must take, however, are remarkably uniform, all agreeing that if raising occurs and if the conditions for the appearance of the reflexive form are met, the complement clause must have third person agreement on the verb. These facts have been discussed briefly in Joseph (1978: Chapter 10; 1979), and in some detail in Joseph & Perlmutter (1979).

23. There is some controversy on this point. Ingria 1981 has drawn attention to some sentences which appear to involve raising of nonsubjects. My informants in general were most unhappy with such sentences, hence my conclusion that Raising is restricted to subjects. Moreover, the only sentences with apparent nonsubject raising that my informants accepted were those involving perception verbs, a class which has proven notoriously resistant to analysis in many languages. Ingria himself, furthermore, argues that the structures in question are not Raising structures, a conclusion I support for the nonsubject instances but not for those involving subjects. See footnote 17 for references on some of the controversy surrounding this construction.

24. See, for example, the discussion in Perlmutter & Soames 1979.

25. I am adopting here an analysis of these rules in which they do not apply in "successive cyclic" fashion.

26. One possibility is that rules that change grammatical relations are necessarily cycle (a principle to this effect was propsoed by Perlmutter and Postal in 1974 lectures). However, there are rules in English that seem to have the effect of changing grammatical relations that do not however "feed" clearly cyclic rules such as (English) Passive and thus seem not to be in the cycle. An example is the Benefactive --> Direct Object rule which produces sentences such as I baked Mary a cake; for many speakers, Mary cannot be passivized (i.e. *Mary was baked a cake (by me)), a fact which would be accounted for if Benefactive --> Direct Object were a noncyclic rule. Such an analysis would mean giving up a typology of rule cycle-type based on effect on grammatical relations.

27. I realize that actually proving that Ancient Greek Reflexivization is cyclic is an impossible task, given the unavailability of all of the relevant data that could be brought to bear on the matter; what is presented here, then, is at best a plausible account that is consistent with known facts.

28. These sentences are much more acceptable if neither Raising nor Reflexivization occur, inasmuch as Raising is somewhat limited in Modern Greek and other means of expressing reflexivity (e.g. through the use of mediopassive verbal morphology) are not only available but generally preferred. Nonetheless, there is no doubt that these rules are part of the grammar of Modern Greek, so that their interaction and application in the same "derivation" is possible in principle. Moreover, although somewhat unusual in nature (note the awkwardness of the English translation), all Greek speakers that I have consulted with on this and related sentences--some 20 in all from various parts of Greece and from a variety of backgrounds--have uniform judgments.

29. This result and related conclusions on the empirical content of the cycle as a syntactic construct have been discussed in Joseph and Perlmutter 1979; I hope to make the results more readily available in a forthcoming monographic study of Raising in Greek.

30. I have carried out about as thorough a search as possible through the vernacular texts of Medieval Greek, covering literally thousands of pages of documents; see Joseph (1978: Chapter 1) for a discussion of the methodology and references regarding the texts examined.

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